THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte BURHAM BAYRAKTAROGLU

_____

Appeal No. 1996-4082
Application 08/179,238[1]

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HEARD: October 18, 1999

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Before KRASS, BARRETT and FRAHM, Administrative Patent Judges.

FRAHM, Administrative Patent Judge.

DECISION ON APPEAL

Appellant has appealed to the Board from the examiner's final rejection of claims 1 to 12 and

[1] Application for patent filed January 10, 1994. According to appellant, the application is a divisional of Application 07/649,378, filed January 31, 1991, now U.S. Patent No. 5,283,448, issued February 1, 1994..

18 to 32. Claims 13 to 15 have been canceled.[2] Claims 16 and 17 stand withdrawn.[3]

BACKGROUND

The subject matter on appeal is directed to the field of semiconductor electronic integrated circuits, and particularly to a heterojunction bipolar transistor (see appellant's specification, page 1). As indicated in the specification (page 2), the prior art recognized a need for heterojunction bipolar transistors having the characteristic properties of both a thin base layer and a low base resistance. Appellant recognized that prior art heterojunction bipolar transistors suffered from difficulties in fabrication during etching such as difficulty in stopping etching at the base without penetrating it when selectively removing the emitter from the base, and difficulty in precisely controlling device parameters such as threshold voltage (specification, pages 1 to 3). To overcome this problem, appellant provides a heterojunction bipolar transistor with a collector region under an etch stop layer, thereby overcoming the problem in the prior art of selectively removing the emitter from the base during etching, lowering the surface potential, solving the threshold problem, and improving ohmic contact properties (specification, page 4).

As further discussed, infra, we find that the applied references to Lunardi and Adlerstein, whether taken singly or in any combination thereof, fail to teach or suggest at least the feature of a

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[2] Claims 13 to 15 were canceled as per appellant's amendment dated January 10, 1994.

[3] Claims 16 and 17 were withdrawn from consideration by the examiner as per page 2 of the the office action dated July 12, 1994.

collector region of a heterojunction bipolar transistor being under an etch stop layer as defined in each of independent claims 1, 7, 19, 21, 23, and 28 on appeal.

Representative independent claim 7 is reproduced below:

7. A heterojunction bipolar transistor, comprising:

(a) an emitter region;

(b) a base region;

(c) an etch stop layer adjacent both said emitter region and said base region; and

(d) a collector region under said etch stop layer.

The following references are relied on by the examiner:

Adlerstein	4,939,562	July 3, 1990
Lunardi et al. (Lunardi)	5,001,534	Mar. 19, 1991 (filed July 11, 1989)

The 35 U.S.C. § 112, second paragraph, rejection of claims 7 to 12, 18, 24, 29, and 30 which was newly made by the examiner in the Answer (see Answer, pages 5 to 6), has been withdrawn.[4]

[4] The Supplemental Answer, at page 1 therein, indicates that the amendment submitted by appellant April 8, 1996, has been entered and overcomes the § 112, second paragraph, rejection which was made for the first time in the Answer.

Claims 1 to 12 and 18 to 32 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Lunardi in view of Adlerstein.

Rather than repeat the positions of appellant and the examiner, reference is made to the Briefs and the Answers for the respective details thereof.[5]

OPINION

It is our view that the prior art relied upon and the level of skill in the particular art would not have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in claims 1 to 12 and 18 to 32. We also find that any conclusion of obviousness of the invention recited in the claims on appeal would necessarily have involved the improper use of hindsight.

In reaching our conclusion on the issues raised in this appeal, we have carefully considered appellant's specification and claims, the applied patents, and the respective viewpoints of appellant and the examiner. As a consequence of our review, we are in general agreement with appellant (Brief, pages 6 to 9; Reply Brief, pages 2 to 4) that the claims on appeal would not have been obvious to one of ordinary skill in the art at the time the invention was made in light of the collective teachings of Lunardi and Adlerstein. For the reasons which follow, we will not sustain the decisions of the examiner rejecting claims 1 to 12 and 18 to 32 under 35 U.S.C. § 103.

[5] We note that the after final amendment dated February 27, 1995, was entered as per the Advisory Action of March 29, 1995; and the Reply Brief and accompanying amendment dated April 8, 1996, have been entered and considered by the examiner (see Supplemental Answer, page 1).

Appellant argues (Brief, pages 6 to 8) that neither Lunardi nor Adlerstein teaches or suggests a collector region being under an etch stop layer, that the combination of Lunardi and Adlerstein also fails to teach or suggest such a feature, that there is no motivation to combine these references, and that to combine these two references in order to achieve appellant's claimed invention would require the use of hindsight. We agree.

We find that neither Lunardi nor Adlerstein, taken singly or in any combination thereof, taught or would have suggested the recited heterojunction bipolar transistor having "a collector region under said etch stop layer" (independent claims 1 and 7 on appeal) or having "a collector region abutting said base region, said collector not abutting said emitter region and under said etch stop layer" (independent claims 19, 21, 23, and 28 on appeal).

Lunardi shows (Figure 1) a collector region (13) as being above an etch stop layer (20). See column 1, lines 29 to 46 (discussing Figure 1). Adlerstein also shows (Figure 5) a collector region (20a-g) as being above an etch stop layer (18a). Indeed, we note that the examiner admits that "the Adlerstein reference fails because Adlerstein's collector (20) is over the underlying composite base (18)" (Answer, page 6). Thus, we agree with appellant, and find that neither applied reference teaches the salient feature recited in all of the independent claims on appeal of a collector region being under an etch stop layer. For at least this reason, we cannot sustain the examiner's decision to reject the claims on appeal under 35 U.S.C. § 103 over Lunardi and Adlerstein.

Further, we agree with appellant (Brief, pages 7 to 8) that there would have been no motivation to combine Lunardi and Adlerstein in order to achieve appellant's recited invention. We find that the examiner's motivation for making the combination in the statement of the rejection (Answer, page 5) fails to provide an explanation for why the ordinary artisan, looking at Lunardi and Adlerstein, would have been motivated to place the collector region under the etch stop layer, as recited in the claims on appeal. As discussed earlier, both references teach a collector region as being above the etch stop layer. Because we find that the examiner has not made a prima facie case of obviousness, we will reverse the decision of the examiner rejecting claims 1 to 7 under 35 U.S.C. § 103.

We also agree with appellant (Reply Brief, pages 2 to 4) that it would not have been obvious to the ordinary artisan looking at Adlerstein that any layer could be made an etch stop layer as asserted by the examiner (Answer, pages 6 to 7), such that the etch stop layer be over the collector region as claimed. We conclude that just because Adlerstein teaches that a layer (18) may be used as both a base and etch stop layer, and just because any layer could or might be used as an etch stop layer, does not mean that the ordinary artisan would have been motivated to place a collector region under the etch stop layer. The fact remains that the layer used by Adlerstein as an etch stop layer, layer 18 in Figure 5, is indeed above the collector region.

We turn last to appellant's argument (Brief, page 8) that the rejection is based on impermissible hindsight. It must be recognized that any judgement on obviousness is in a sense necessarily a

reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See In re McLaughlin, 443 F.2d 1392, 1395, 170 USPQ 209, 212 (CCPA 1971). We agree with appellant that the reasoning of the obviousness rejection (see Answer, page 5) took into account knowledge gleaned only from applicant's disclosure. Specifically, one would have to look to applicant's disclosure for direction to place the collector region under the etch stop layer. Only appellant's claims teach a collector region under an etch stop layer.

In light of the foregoing, the differences between the subject matter recited in the claims and the references are such that the claimed subject matter as a whole would not have been obvious within the meaning of 35 U.S.C. § 103. Accordingly, we shall reverse the standing rejection of claims 1 to 12 and 18 to 32 on appeal.

REVERSED

EROLL A. KRASS)
Administrative Patent Judge)
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	)	BOARD OF PATENT
LEE BARRETT	)	
Administrative Patent Judge	)	APPEALS AND
	)	
	)	INTERFERENCES
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ERIC FRAHM	)	
Administrative Patent Judge	)	

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